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POVERTY, INCOME DISTRIBUTION AND DETERMINANTS OF POVERTY AMONG TEACHERS IN PRE-TERTIARY SCHOOLS IN GHANA

Emmanuel Dodzi K. Havi
Methodist University College Ghana, Department of Economics

Abstract

This study looks at poverty and its determinants among pre-tertiary schools teachers in the Eastern Region of Ghana. The study adopted the national moderate poverty line in GLSS4 which was updated using the consumer price index. The objectives of the study were to find out the poverty status of teachers and its determining factors using poverty indices and binary logistic regression model. It was found out that on average teachers are not poor relative to the poverty line. The result showed that large-households were poorer in relation to the small-households; male-teachers were also poorer as compared to female ones. Also, those who spend more years in Ghana Education Service were poorer; poverty diminishes with advancement in educational level. Also, income was fairly distributed. Finally, the small-household size and spouse with tertiary and secondary educational level were significant determinants of the teacher's poverty. The study recommends that teachers should improve upon their educational level and keep smaller household to improve their wellbeing.

Keywords: Poverty Line, Income Distribution, Determinants of Poverty, Poverty Indices, *Binary* Logistic Regression

Introduction

In 1983, the Government of Ghana implemented a gradual but sustained adjustment strategy under the Economic Recovery Program (ERP). This was in two phases; ERP I [Stabilisation Stage] and ERP II [Structure Adjustment Program, (SAP)]. The ERP was implemented with the belief that the changes in the relative prices which are central to any adjustment program would incite economic agents to allocate resources based on market signals. The reforms under the ERP have successfully turned the economy around. During the period of the ERP, 1983-93, the growth rate of the real Gross Domestic Product (GDP) averaged around 5% per annum. A large part

of the growth in per capita GDP reflected the larger growth in per capita private consumption which increased by an average amount of 3% per annum over the period 1987-92. Average income per capita growth rate increased during the same period from -5% to 2% per annum. Inflation came down from a peak of 123% in 1983 to 10% in 1992. The year 1991 was the high point in the Ghana's ERP; inflation was down, a budget surplus equivalent to 1.5% of the GDP, real GDP growth rate at 5.3%, the growth of money supply was high but falling. However, in 1992 a fiscal shock resulted in a break in the otherwise sustained progress in terms of inflation, fiscal balance, private investment and current account balance (World Bank, 1995). This turn round of the economy during SAP, the SAP left some people in the country jobless and poor. To address this problem the Government in 1995 introduced the Poverty Reduction Strategy to tackle the poverty issues in the country and later join the World Bank program of Highly Indebted Poor Countries (HIPC) in 2001.

Report from the Interim Poverty Reduction Strategy Paper 2000-2002 and GLSS 3 & 4 also showed that the overall trend during the 1990s has been broadly favourable in Ghana. But when one considers the economic activities in which households are engaged, poverty varied considerably. The services sector in Ghana comprises tertiary economic activities which are very important for development. These services have made significant contributions to total output over the years. From The State of the Ghanaian Economy 2002, the services sector contributed 33% to GDP. However, the sector has its share of problems. This paper, therefore, tries to find out the teacher's poverty level and its determinants among teachers in pre-tertiary schools. Teacher's remuneration is the same in Ghana, so from simple random sampling the samples were selected from Eastern region.

It is imperative to attempt definitions of poverty with a view to identifying its meaning and scope. Repnik, (1994), stated that poverty can be expressed as, firstly, the inability to satisfy basic needs of human life due to the lack of income or property; secondly, a lack of opportunity to generate income or property; and, thirdly, a lack of the means to change the situation.

The World Development Report, 1990, defines poverty as the inability to attain a minimum standard of living and housing. Ravallion, (1994) referred to poverty as the lack of command over basic consumption needs. Sen (1983) defines poverty as the lack of certain capabilities, such as being able to participate with dignity in society. In sum, poverty can be defined as lack of income or inability to generate income to meet the basic needs of one's life or members of one's household.

Achieving equitable distribution of income and alleviation of poverty has for some time been a major developmental objective. The World Bank and the International Monetary Fund (IMF) appraised development policies

in terms of how far these development objectives are being realized. In the 1980s, many Least Developed Countries (LDCs) introduced Structural Adjustment Program (SAPs) in an effort to promote growth and redress the negative trends in a number of economic indicators. From the poverty profile of Ghana, it is clear that the economic strategies, plans and adjustment policies have had a negative impact on some socio-economic groups. From the profile, poverty in some regions and in some economic activities reduced, some remained unchanged while poverty increased in some areas GLSS 3&4. On the whole knowledge about poverty and its reduction in Ghana is not lacking, but what is probably lacking is the sectoral poverty analysis. This will help the policy makers to direct their effort to improve the appropriate sectors in the economy. Therefore, this study has covered poverty and its determinants among teachers in the pre-tertiary schools.

The objectives of the study are to estimate the poverty indices, income distribution and determinants of poverty among teachers in pre-tertiary schools.

Poverty reduction is an important developmental concern as a result designing effective targeting indicators require in-depth knowledge of who is poor, how many are they and on average what fraction of the minimum cost of living is required to bring the poor out of poverty. Also when teachers are poor it will affect standard of education and the human resource base in Ghana as a whole. Accordingly, this study analyzed issues of poverty, and its determinants among teachers in pre-tertiary schools teachers in the Eastern Region of Ghana.

Poverty reduction strategy and emperical review

There are policies put in place by some institutions to reduce poverty in societies. The World Bank (1990) recommended a two-pronged approach to poverty reduction through the promotion of economic growth, and special programs to increase human capital formation and provide safety nets for the vulnerable groups such as women and children. The United Nations Development Program (UNDP) also recommends a two-pronged strategy, such as the promotion of growth and meeting basic needs, but the latter was preferred. Repnik (1994), believes that the creation of general conditions which allow man to live in dignity, where people are free to take their own decisions in life, and where the poor participate in social, political and economic decision-making will bring about poverty alleviation.

In line with the position of the World Bank and UNDP, Van de Walle (1990) suggested that the satisfaction of basic needs directly alleviates some of the most severe consequences of poverty. She contended that healthy, well-nourished, and educated individuals obviously have a higher standard of

living than sick, hungry, and ignorant ones. This is because the former are more productive and better able to respond to new opportunities. She, therefore, suggested investment in human capital and involvement of the poor in the growth process.

According to the World Bank Development Report (2001/02), poverty is widespread in Africa. From this report, using the international poverty line of US $1 per person per day showed that Sub-Saharan Africa had the highest head–count ratio (close to 50%) among all world regions for all the years surveyed between 1987 and 1998. Head–count ratio in excess of 40% of the population is recorded only for the South Asia sub-region, ranking second to Sub-Saharan Africa. However, when the poverty line is increased to $2.15 per person per day both ranking and the magnitudes of poverty results change, with Sub-Saharan Africa (76%) ranking 2nd to South Asia (84%) as the highest poverty incidence region. North Africa (22%) also ranks second to East Europe as the lowest poverty incidence sub-region.

A study conducted by Okurut et al(2002) on the determinants of regional poverty in Uganda found that Northern Uganda was the poorest region; it has the largest depth of poverty and worst inequality. It is characterized by the poor having large mean household-sizes, least education, least mean household income, least expenditure on health, lowest chance of child survival and highest concentration in the rural areas. Educational level of household head, household-size and migration status were found to be significant determinants of poverty at multivariate levels.

According to Boateng (2000), poverty in Ghana is a rural phenomenon and there were large regional disparities in the incidence and depth of poverty. The study established that between 1987 and 1992 poverty was concentrated among subsistence farmers, but it was low among export crop farmers. Also, marginal disparities in poverty between female- and male-headed households were detected. The study also found a strong correlation between poverty and level of schooling. Between 1987 and 1992, around 50-70% of household heads without any schooling in Ghana suffered from extreme poverty. The study found that formal education and wage employment are the two factors that are strongly correlated with poverty reduction.

Preliminary results from the Zimbabwean case study (Kaliyati, 2000) showed high poverty rates in 1995. Applying an absolute poverty line to consumption expenditure from the 1995 poverty assessment survey, the study shows that 72% of households in Zimbabwe in 1995 were poor, with the national poverty rate among male-headed households being lower (69%) compared to the female-headed households (78%). However, female-headed households in Harare, the capital city, have a lower poverty rate (47%) compared to male-headed households (57%).

Methodology

Poverty Measure

There are a number of conceptual approaches to the measurement of well-being. This study used income per adult-equivalent (Y) instead of income per capita because the adults' needs are more than those of children. Using the "OECD scale," the adult-equivalent (AE) is computed as $AE = 1 + 0.7Y(N_{adult} - 1) + 0.5N_{children}$. The poverty measure developed by Foster, Greer and Thorbecke (FGT) (1984), which measures poverty indices based on a single formula called p-alpha measure of poverty, is capable of incorporating any degree of concern about poverty through the poverty aversion parameter, α, which is expressed as $P_\alpha = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^\alpha$, where z is the poverty line, q is the number of households below the line, N is the total sample, y_i is the income per adult-equivalent of the i th household, and α is the FGT parameter, α = 0, 1 and 2 .

The quantity in the parentheses is the proportionate shortfall of income below the poverty line. By increasing the value of α, the "aversion" to poverty as measured by the index is increased. The simplest and most common measure is the incidence of poverty (P_0) which is the ratio of the number of poor to total population. This gives the proportion of the population with income below the poverty line. When there is no aversion to poverty, α = 0, the index becomes, $P_0 = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^0 = \frac{q}{N}$.

A moderately popular measure of poverty is the poverty gap index or income gap measure which adds up the extent to which individual households fall below the poverty line and express it as a percentage of the poverty line. If the degree of aversion to poverty is increased, so that α = 1, the index becomes, $P_1 = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^1$.

If the difference between the income measure and the poverty line for all those who are below is summed up, then it shows the total money required to eliminate poverty by making perfectly targeted transfers to the poor, in absence of transaction costs and disincentive effects. The ratio of $\frac{P_1}{P_0} = \frac{1}{q}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^1$ gives the income gap ratio or the depth of poverty or how average welfare of the poor falls below the poverty line.

The square poverty gab index is a weighted sum of the poverty gaps as a proportion of the poverty line, where the weights are the proportionate poverty gaps themselves. By squaring the poverty gap index, the measure

puts more weights on observations that fall well below the poverty line. If the degree of aversion to poverty is increased so that α = 2, the index becomes; $P_2 = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{z-y_i}{z}\right)^2$. In this case the income gap is squared index which allows concern for the poorest of the poor by attaching greater weight to the poverty of the poorest than to that of those just below the line. This index measures the severity of poverty and it satisfies the Sen's transfer axiom, which requires that when income is transferred from a poor to a poorer person, poverty measures decreases.

Another advantage of the p-alpha measures is their decomposability. The overall poverty can be expressed as the sum of groups' poverty weighted by the population share of each group. Thus, $P_\alpha = \sum k_j P_{\alpha j}$, where j = 1, 2, 3… m groups, k_j is population share of each group, and P_j is the poverty measure for each group.

The Logistic Regression Model

Let Y_i be a dichotomous variables indicating whether or not a teacher is poor and Y_i^* being a teacher is poor. Therefore, $Y_i = \begin{cases} 0, & \text{teacher is not poor} \\ 1, & \text{teacher is poor} \end{cases}$ and $Y_i^* = \beta_0 + \beta_j X_{ij} + \varepsilon_i$, where X_{ij} are the j^{th} variable for the i^{th} individual, β_0 and β_j are parameters of the model and ε_i is the error term with cumulative logistic distribution. Suppose $\pi(x) = P(1 \mid x)$ represents the conditional probability that an individual teacher is poor, X, when the logistics distribution is used. Here the regression coefficient β_j estimate the change in the log odds of being poor for one unit increase in the j^{th} explanatory variable (j = 1, 2,…,k), controlling for all explanatory variables in the model. These parameters are estimated by the maximum likelihood estimation method. The factors by which the odds change when the j^{th} independent variable increases by one unit is given by Exp(β_j). If the independent variable is dichotomous, then the odds ratio Exp(β_j) approximates how much more likely (or unlikely) it is for the outcome to be present among those with X = 1 than among those with X = 0. In order to make inference from the model, there is the need to test the significance of the coefficients and t-statistics is used for this purpose.

Data Source and Estimation Procedure

The questionnaires used for the survey were pre-tested and validated. The final questionnaires were administered to teachers in pre-tertiary schools in the region and out of 500 questionnaires 487 were successfully collected; these consist of 117 questionnaires from secondary schools and 370 questionnaires from the basic schools. This distribution was base on the ratio of teachers head-count conducted by GES in January 2004; 19 basic schools teachers to 6 secondary schools teachers. The sample from the region was based on simple random sampling. The study adopted the national moderate poverty line (¢900,000) per person per year in 1999. This threshold was updated using the consumer price index (CPI) to (¢2,672,832) per person per year in March 2004. This poverty line was used for reasonable comparison of the poverty indices computed from the questionnaire with the national indices published in the GLSS 4.

Results and discussions

Poverty Results

The poverty indices of the teacher's household income per adult-equivalent, mean income and population share of the subgroups are shown in table 4.1 below. From the table, the mean income of ¢6,755,381 is more than the poverty line, ¢2,672,832. This implies that the average standard of living of a teacher was above the poverty line. Teachers who served more years in GES and those with large household-size earned less income. From the table, 4.9% of the sample was poor that is the incidence of poverty; the individuals who were poor, their income fall below the poverty line by 0.7% that is the poverty gab, with severity of poverty being 0.2%. The depth of poverty was 14.3%, implying the average welfare of poor teacher's household fell below the poverty line by this percentage. From the table, the average income for both sexes was above the poverty line. From the table, 7.7% of male and 1% of female-teachers' household were poor. This shows that the male-teachers' households were poorer compared to the female. Also the male's average welfare fell more under the poverty line than the female. This confirmed the findings of Kaliyati (2000), that female-headed household in the city of Harare, have lower poverty rate than the male-headed households, but is contrary to his finding at the national level where male-headed household had lower poverty rate.

Considering the number of years teacher's served in Ghana Education Service (GES), from the table, 4.3% of those who served less than ten years, 4.8% of those who served between ten to twenty years and 6.1% of those who served more than twenty years were poor. However, those who served less than ten years in GES needed 9.3% of the poverty line to get out of poverty while those who served more than 20 years needed 22.9%. From the table, the incidence of poverty in basic and secondary schools were 6.2% and

0.9% respectively. Considering the household-size, from the table, 0.9% of small and 8.5% of large households were poor. The large household's wellbeing is also below poverty line by 15% while the small household's wellbeing also fell by 11.1%. This confirmed the finding of Kaliyati, (2000) in Zimbabwe that poverty was higher among the large household-size than the small household. Considering the certificate held by the teachers, 7.8% of Certificate-A, 2.6% of Diploma and 1.5% Graduate teachers' households were poor. This confirmed the finding of Okurut, (2002), which revealed that the poor have large household-size and least education. This also agreed with Van de Walle, (1990) that healthy, well-nourished and educated individual have a higher standard of living.

Table 4.1: Poverty Indices for Income-per-Adult-Equivalent, %.

Income	Population Share	Average income	P_0	P_1	P_2	P_1/P_0
Sample	100	6755381	4.9	0.7	0.2	14.3
Sex						
Male	58.73	6189096	7.7	1.2	0.3	15.6
Female	41.27	7561139	1.0	0.1	0.0	10.0
Level						
Basic	76	6692002	6.2	0.9	0.2	14.5
Secondary	24	6955802	0.9	0.4	0.2	44.4
Years Served, GES						
< 10	36.60	8038828	4.3	0.4	0.1	9.3
10 to 20	34.29	6062247	4.8	1.1	0.4	13.1
> 20	27.11	5804361	6.1	0.8	0.1	22.9
Household-Size						
Small	46.82	8398435	0.9	0.1	0.0	11.1
Large	53.18	5308986	8.5	1.3	0.3	15.3
Educational Attainment						
Certificate-A	47.64	6194731	7.8	1.2	0.3	15.4
Diploma	38.81	6894789	2.6	0.4	0.1	15.4
Graduate	13.55	8326938	1.5	0.3	0.1	2.0

Income Distribution

Income distribution of teachers in pre-tertiary schools is measured in quintiles. Table 4.2 below shows the distribution of teacher's income over quintiles. From the table, about 40.05% of teachers were in the two lower quintiles, meaning 40.05% of teachers had access to 40% of the income and 19.9% in the fifth quintile, the richest income-group. Considering the basic school, 22.03%, 18.31% and 18.64% fell into the first, second and the fifth quintiles, respectively while among secondary teachers 15.38%, 23.93% and 23.08% fell into the first, second and fifth quintiles, respectively. This showed that more of the basic teachers fell into lower quintiles and more of the secondary teachers fell into higher quintiles. From the table, more male-teachers fell into the lower quintiles while larger percentage of female-teachers fell into the higher quintiles. From the table, more of the Certificate-

A teachers fell into the lower quintiles while more of the graduate fell into the higher quintiles. This showed that the Certificate-A teachers' income can be improved through upgrading in educational attainment.

Table 4.2: Distribution of Income of Teachers over Quintiles, (%)

		Quintiles					
		Poorest1	2	3	4	Richest5	Grand Total
Level	Basic	22.03	18.31	21.36	19.66	18.64	100
	Secondary	15.38	23.93	17.09	20.51	23.08	100
Sex	Male	24.59	23.36	17.21	16.8	18.03	100
	Female	13.69	14.88	24.4	24.4	22.62	100
Qualification	Certificate-A	27.75	17.28	15.71	22.51	16.75	100
	Diploma	16.15	20.5	22.98	17.39	22.98	100
	Graduate	6.67	26.67	26.67	18.33	21.67	100
	Grand Total	20.15	19.9	20.15	19.9	19.9	100

Determinants of Poverty

The linearized logistic regression of the determinants of poverty is shown in table 4.3 below. The odd ratios showed the outcome to be present among those with X = 1 than among those with X = 0. From the table, controlling for male, female-teachers were of 0.7979 times likely to be poor among the male-teachers. This means that female-teacher were less poor compared to their male counterparts. Considering those who served less than 10 years were 0.9119 times and those teachers who serves between 10 and 20 year in GES were 0.9761 times likely to be poor among those who served more than 20 years. This means that those who served less than 10 years and those teachers who serves between 10 and 20 year in GES were better off than those who served more than 20 years. Also, diploma holders were 0.9415 times and graduates were 0.6788 times likely to be poor among teachers who held certificate-A. However, these determinants were not statistically significant as their respective probability values were more than 0.05 percent.

Considering educational level of ones spouse, teachers whose spouse had tertiary education were 0.0682 times, secondary education were 0.1965 times and primary education were 0.3895 times likely to be poor among teachers whose spouses had no education. Finally, teachers with smaller household were 0.0490 time likely to be poor among teachers with large households. Therefore, small household-size and tertiary educational level of ones spouse were statistically significant factors that determine the level of teacher's poverty with their probability value less than 0.05%. This means that teachers with small household-size and a spouse with tertiary and secondary educational level were less likely to be poor.

Table 4.3: Logistic Regression of Determinants of Poverty

Poor	Odds Ratio	Linearized Std. Err.	t	P>t	95% Confidence Interval	
Sex						
Male	1					
Female	0.7979	0.3236	-0.56	0.578	0.3595	1.7710
Years Served in GSS						
< 10	0.9119	0.3462	-0.24	0.808	0.4323	1.9235
10 -20	0.9761	0.3882	-0.06	0.952	0.4467	2.1332
> 20	1.0000					
Qualification						
Certificate-A	1.0000					
Diploma	0.9415	0.3581	-0.16	0.874	0.4458	1.9886
Graduate	0.6788	0.1967	-1.34	0.182	0.3841	1.1998
Spouse Education						
Tertiary	0.0682	0.0391	-4.68	0	0.0221	0.2107
Secondary/Voc.	0.1965	0.1251	-2.56	0.011	0.0562	0.6868
Basic	0.3895	0.2551	-1.44	0.151	0.1075	1.4114
No education	1.0000					
Household-size						
Small	0.0490	0.0199	-7.41	0	0.0220	0.1091
Large	1.0000					

Conclusion

This study examined the poverty, income distribution and determinants of poverty among the pre-tertiary school teachers in the Eastern Region of Ghana. The study revealed that on average teachers were not poor and they live above the moderate poverty line. The result showed that the spread of poverty for the entire sample was 4.9%, while its poverty gab and severity were 0.7 and 0.2. Comparing this with the moderate poverty line in the GLSS 4, the incidence of poverty for all Ghana was 42.6% with poverty gab and severity, 13.9% and 6.6% respectively. This showed that teachers are better off as compared to the general public. The study revealed that female-teacher's household had higher standard of living and were less poor.

From the study, the years served by teachers revealed that the standard of living declined as a teacher served more years. This was associated with the corresponding high incidence of poverty for the teachers who served for more years. The study showed that teachers with small households had higher standard of living, therefore, the incidence and the depth of poverty associated with these households were low. Also the teachers with higher level of education had higher standard of living. Income was fairly distributed among teachers. Finally, small household-size, tertiary

and secondary educational level of one's spouse were statistically significant determinants of teacher's poverty level.

The study recommends that teachers should be encouraged to improve upon their own and sposue educational level as poverty reduces with increase in educational level. Also, teachers are encourage to keep smaller household since large household sizes were poorer.

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